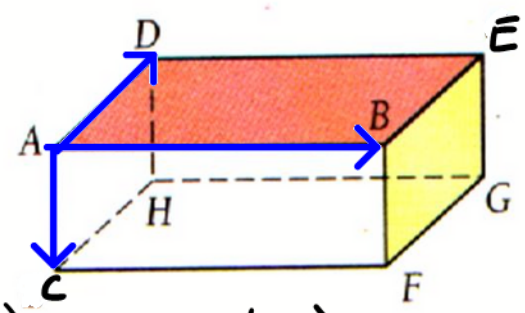
Exemple : $A(1,2,-1)$, $B(1,-1,2)$ et $C(1,1,2)$

$$\mathcal{A}(ABC) = \frac{1}{2}\left\| \overrightarrow{AB} \wedge \overrightarrow{AC} \right\|.$$

or $\overrightarrow{AB}\begin{pmatrix}0\\-3\\3\end{pmatrix} \wedge \overrightarrow{AC}\begin{pmatrix}0\\-1\\3\end{pmatrix}$; donc $\overrightarrow{AB} \wedge \overrightarrow{AC}\begin{pmatrix}12\\0\\0\end{pmatrix}$

Donc $\mathcal{A}(ABC) = \frac{1}{2}\sqrt{12^2+0^2+0^2} = \boxed{6}$

Volume de parallélépipede



$$V(ABEDCFGH) = \left|\left(\overrightarrow{AB} \wedge \overrightarrow{AC}\right).\overrightarrow{AD}\right|$$

Exemple : $\overrightarrow{AB}\begin{pmatrix}0\\-3\\3\end{pmatrix}$; $\overrightarrow{AC}\begin{pmatrix}0\\-1\\3\end{pmatrix}$ $\overrightarrow{AD}\begin{pmatrix}1\\1\\-1\end{pmatrix}$

$$V(ABCDEFGH) = \left| \overrightarrow{AB} \wedge \overrightarrow{AC}\begin{pmatrix}12\\0\\0\end{pmatrix} . \overrightarrow{AD}\begin{pmatrix}1\\1\\-1\end{pmatrix} \right|$$

$$= \left| 12\times 1 + 0\times 1 + 0\times(-1) \right|$$

$$= |12| = \boxed{12}$$